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GENERAL NOTES

THE SUITABILITY OF *JUNIPERUS* (CUPRESSACEAE) FOR LARVAE OF *CALLOPHRYS HESSELI* (RAWSON AND ZIEGLER) (LYCAENIDAE)

Aside from the wing character differences and distinct male and female genitalia distinguishing *Callophrys hesseli* from other Nearctic Cupressaceae-utilizing *Callophrys* (*Mitoura*) (Rawson & Ziegler, 1950, J. N.Y. Entomol. Soc. 58:69–82; Johnson, 1978, J. Lepid. Soc. 32:3–19, and 1976, Bull. Allyn Mus. 38:1–30), its utilization of *Chamaecyparis thyoides* (L.) B.S.P. as the larval foodplant is a major taxonomic trait distinguishing it from its nearest spatial relative *C.* (*Mitoura*) *gryneus* Hübner. The latter is known to feed on four species of *Juniperus* L. (Johnson, 1978, loc. cit.). The two butterfly species are regionally sympatric but allopatric on the local level, except for occasional overlap in usage of nectar sources (Johnson, 1978, loc. cit.). No naturally occurring hybrids or instances of larvae feeding on the foodplant of the other species are presently known.

In laboratory studies, Remington & Pease (1955, Lepid. News 9:4–6) demonstrated larvae of *gryneus* could be raised to the imago stage on *C. thyoides* and not be nutritionally sterile. In their conclusions concerning suitability of *C. thyoides* for *gryneus* they stated the importance of knowing whether *Juniperus virginiana* L. (the foodplant of *gryneus* in eastern North America) was equally suitable in the laboratory for *hesseli*.

During studies of Nearctic *Callophrys* (*Mitoura*) (Johnson, 1984, Bull. Am. Mus. Nat. Hist., in press) this author received a number of second-hand reports of rearing of *hesseli* on *J. virginiana*; however, none could be verified with accurate data. The purpose of this note is to report the first verifiable rearing of *hesseli* on *Juniperus*.

Eric Quinter (American Museum of Natural History, New York) collected a series of live *hesseli* females on 17 May 1971, 3.6 mi. E of Chatsworth, Burlington Co., New Jersey. All were confined under incandescent light in mesh bags above sprigs of *C. thyoides* (in anticipation of rearing all larvae on this plant). Oviposition soon took place and over a hundred larvae were reared on *C. thyoides* until all larvae were in the second instar. When available foodplant supplies dwindled about 50 larvae in the second instar were transferred to *Juniperus virginiana* in hopes they might survive. All continued to feed readily and maintain normal growth. These larvae reached the last instar showing no difference from those on *C. thyoides*. Then a fungal infestation attacked the entire rearing apparatus, occurring just prior to expected pupation and resulting in a high mortality rate in larvae on both foodplants. In fact, of the healthy larvae on *J. virginiana*, only one last instar larva escaped infestation; however, it pupated readily and emerged on 10 July. Unfortunately, it was impossible to mate this male individual with a reared female from the same foodplant to test possible sterility.

This rearing demonstrates that *J. virginiana* is at least suitable for adult maturation in *Callophrys hesseli*. It is particularly impressive because the transference of larvae in middle or later instars is usually considered highly unfavorable to normal maturation or survival (Downey & Dunn, 1965, Ecology 45:172–178; Dethier, 1954, Evolution 8: 33–54). Usually in rearing experiments either ova or freshly emerged larvae are transferred to an alternative foodplant. Suitability of *J. virginiana* after the first instar, however, still does not prove full laboratory compatibility. Mortality might have occurred during the first instar itself. Also, with lack of testing for nutritional sterility, and more importantly, oviposition preference of reared females, this rearing can only provide limited conclusions. Any adequate test of ovipositional specificity in reared females would require larvae reared solely on one or the other plant. However, it is significant to record an instance of successful rearing to the adult stage on the alternative butterfly/foodplant combination used by Remington & Pease. Although suitability in the laboratory is no test of suitability in nature (Downey, 1962, System. Zool. 11:150–159; Downey & Dunn, loc. cit.; Dethier, loc. cit.), it is further evidence that specificity in the natural environment (which in the case of *C. hesseli* and *C. gryneus* seems justi-

fiably assumed by the abundant field data available on these species) is preserved by the oviposition habits of the female, according to Hopkins' Hostplant Principle.

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THE TYPE OF *ARGYNNIS APACHEANA* SKINNER

In 1954 (Trans. Amer. Entomol. Soc. 80:91–117) Gillham & Ehrlich published an excellent review of the butterfly names established by Henry Skinner. They questioned the statement in dos Passos & Grey (1947, Amer. Mus. Novitates, No. 1370, 30 pp.) that the type of *Argynnis apacheana* Skinner is from Arizona and in the Academy of Sciences, Philadelphia. The specimen referred to by dos Passos & Grey was in the collections of the Academy, but has been transferred to the Carnegie Museum of Natural History, Pittsburgh, Pennsylvania. It is designated ANSP No. 7031 and carries labels reading "holotype" and "Arizona, collector Skinner." This is contrary to Skinner's declaration of the type of *apacheana* in the original description, quoted by Gillham & Ehrlich.

Skinner (Entomol. News 29:67, 1st paragraph) wrote: "I propose the name *apacheana* for the species of *Argynnis* described and figured by Mr. W. H. Edwards in Volume I of his *Butterflies of North America*, plate IV of *Argynnis*, figures 1, 2, ♂, 3, 4, ♀, under the name *nokomis*." There is no other declaration of type in the article. The butterfly figured on this plate is not the type of the name *nokomis*. In fact, the plate in bound copies of the volume is not the original plate which was drawn from the type by Wiest. The plate referred to is the replacement for that plate. The new plate was drawn by Mrs. Mary Peart from specimens collected by the Wheeler Expedition in 1871, eight years after *nokomis* had originally been described.

Almost everyone has been misled by the locality designation "Arizona" for material sent east by the 1871 Wheeler Expedition. This designation is very much like the old one "Bogota" for Colombian butterflies; meaningless. A timetable and route for the expedition was published by Brown in 1957 (J. N.Y. Entomol. Soc. 65:219–234). The cases of specimens for the Smithsonian Institution were dispatched from Tucson, Arizona, the breakup point, in December 1871. These boxes contained material from most of the route. All that Baird told Edwards when he transmitted the material is that he had received it from Arizona (Brown, F. M., 1965, Trans. Amer. Entomol. Soc. 91: 233–350).

Some years ago I sent Scott Ellis and Samuel Johnson to Owens Valley, California to see if they could recover the species collected there by Bischoff and thus, narrow down type localities. They were successful in general but unsuccessful for *Cercyonis wheeleri* and *Speyeria "nokomis" (apacheana)*. Diversion of water from Owens Valley by the city of Los Angeles has destroyed the niches in which these sensitive species had lived. It is only in the vicinity of Round Lake, where the requisite *Viola* grows in the understory of the meadow and bog grasses, that *apacheana* is still found.

Dr. dos Passos is very ill, so I asked Mr. Paul Grey to correct the type statement, but he asked that I do it. Since the figure upon which Skinner based his name *apacheana* was drawn from material collected by Bischoff in 1871, that material must supply the type. The specimen that was used by Mrs. Mary Peart for the model of the male figure on plate *Argynnis* IV must be considered the type of *apacheana*. That specimen was